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FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
MENBERU, BENIYAM	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/933,036	SAWADA ET AL.	
	Examiner	Art Unit	
	Beniyam Menberu	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/21/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 43, line 27, "V, M, Y" should be "C, M, Y".

Appropriate correction is required.

Drawings

2. The drawings are objected to because reference 142 and 143 in Figure 4 is labeled incorrectly. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 3, 4, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5113248 to Hibi et al.

Regarding claim 1, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

black generating means for generating a black signal accordance with a difference between maximum value and a minimum value among three values indicating the three primary colors each pixel in said color image data, and said minimum value (Figure 1, reference 6, 5, 4,"Max", "Min"; column 5, lines 10-14).

Regarding claim 2, Hibi et al teach all the limitations of claim 1. Further Hibi et al disclose the image processing apparatus according to claim 1, wherein said color image data is the three primary colors of cyan, magenta, and yellow (Figure 1, input to reference 4).

Regarding claim 3, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

address generating means for generating an address based on a difference between a maximum value and minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4);

a lookup table in which data is read from the address generated by the address generating means(Figure 1, reference 6) and,

black ink generating means generating a black ink signal based on the data read from the lookup table (output of reference 6 in Figure 1; column 5,lines 10-14).

Regarding claim 4, Hibi et al teach all the limitations of claim3. Further Hibi et al disclose the image processing apparatus according to claim 3, wherein said lookup table is a two-dimensional lookup table (Figure 1, reference 6; Since there are two address input it must be two dimensional lookup table).

Regarding claim 6, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

undercolor generating means for generating an undercolor signal in accordance with a difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Figure 1, reference 7, 6, 5, 4, "Max", "Min");

correcting means for correcting the three values indicating the three primary colors for said each pixel based on the undercolor signal generated by the undercolor generating means (column 5, lines 1-17).

Regarding claim 7, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

address generating means for generating an address based on a difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4);

a lookup table in which data is read from the address generated by the address generating means (Figure 1, reference 6);

undercolor generating means for generating an undercolor signal based on the data read from the lookup table (Figure 1, reference 7, 6, 5, 4, "Max", "Min"); and

correcting means for correcting the three values indicating the three primary colors for said each pixel based on the undercolor signal generated by the undercolor generating means (column 5, lines 1-17).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5113248 to Hibi et al in view of U.S. Patent No. 5729360 to Kita et al.

Regarding claim 5, Hibi et al teach all the limitations of claim3. However Hibi et al does not disclose the image processing apparatus according to claim 3 wherein said lookup table stores a data group monotonously decreasing with an increase of said maximum value when said minimum value constant, and stores a data group monotonously increasing with the increase of said minimum value when said difference between the maximum value and the minimum value constant, and the data is read from said address.

Kita et al disclose the image processing apparatus according to claim 3 wherein said lookup table stores a data group monotonously decreasing with an increase of said maximum value when said minimum value constant, and stores a data group monotonously increasing with the increase of said minimum value when said difference between the maximum value and the minimum value constant, and the data is read from said address (column 5, lines 35-47; column 8, lines 34-37: Since India ink is related to black colorant and minimum(YMC) thus increasing the minimum(YMC) results in increasing the black colorant).

Hibi et al and Kita et al are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the data group taught by Kita et al with the color printing system of Hibi et al to implement accurate color printing system.

The motivation to combine the reference is clear because Kita et al provides for a high quality printing character images (column 4, lines 8-14).

7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5113248 to Hibi et al in view of U.S. Patent No. 6389161 to Krabbenhöft.

Regarding claim 8, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

address generating means for generating an address based on a difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4). Hibi et al discloses black ink generating means for outputting the data read from said lookup table (Figure 1, reference 6). However Hibi et al does not disclose a lookup table having a storage capacity of a number obtained by totaling a number at which said difference between the maximum value and the minimum value is an integral multiple of a predetermined value and a number at which the difference is other than the integral multiple and said maximum value is equal to a maximum value of a defined region, and in which data is read from the address generated by said address generating means; and black ink generating means for outputting the data read from said lookup table as a black ink signal when said difference between the maximum value and minimum value is the integral multiple of the predetermined value or when said maximum value is equal

to the maximum value of the defined region, and for interpolating/generating and outputting the black ink signal from the data read from said lookup table and data read from an address adjacent to said address when said difference between the maximum value and the minimum value is not the integral multiple of the predetermined value and when said maximum value is not equal to the maximum value of the defined region.

Krabbenhöft disclose interpolation method wherein a lookup table having a storage capacity of a number obtained by totaling a number at which said difference between the maximum value and the minimum value is an integral multiple of a predetermined value and a number at which the difference is other than the integral multiple and said maximum value is equal to a maximum value of a defined region (column 4, lines 25-40, lines 45-51; The grid points refer to the integral multiple and thus the difference value used in addressing will match these grid points in certain occasions and by definition the size of the table is how many grid points which total points divided by step size), and in which data is read from the address generated by said address generating means; and

black ink generating means for outputting the data read from said lookup table as a black ink signal when said difference between the maximum value and minimum value is the integral multiple of the predetermined value or when said maximum value is equal to the maximum value of the defined region, and for interpolating/generating and outputting the black ink signal from the data read from said lookup table and data read from an address adjacent to said address when said difference between the maximum value and the minimum value is not the integral multiple of the predetermined value and

when said maximum value is not equal to the maximum value of the defined region (column 3, lines 32-55; By definition if a point is located at the maximum value it cannot be interpolated so if it is maximum value its value has to be defined in the lookup table).

Hibi et al and Krabbenhöft are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the lookup table method of Krabbenhöft with the color printing system of Hibi et al to implement efficient lookup table for color printing.

The motivation to combine the reference is clear because reducing the size of a lookup table can save memory space and provide for an efficient color conversion.

Regarding claim 9, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

address generating means for generating an address based on difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Hibi et al: Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4). Further Hibi et al disclose undercolor generating means for outputting the data read from said lookup table as an undercolor signal based on difference between minimum and maximum (Figure 1, reference 7, 6, 5, 4, "Max", "Min") and correcting means for

correcting the three values indicating said three primary colors based on undercolor signal outputted from the undercolor generating means (Hibi et al: column 5, lines 1-17). However Hibi et al does not disclose a lookup table having a storage capacity of a number obtained by totaling a number at which said difference between the maximum value and the minimum value is an integral multiple of a predetermined value and a number at which the difference is other than the integral multiple and said maximum value is equal to a maximum value of a defined region, and in which data is read from the address generated by said address generating means and an undercolor generating means for outputting the data read from said lookup table as an undercolor signal when said difference between the maximum value and the minimum value is the integral multiple of the predetermined value or when said maximum value equal to the maximum value of the defined region, and for interpolating/generating and outputting the undercolor signal from the data read from said lookup table and data read from an address adjacent to said address when said difference between the maximum value and the minimum value is not the integral multiple of the predetermined value and when said maximum value not equal to the maximum value of defined region.

Krabbenhöft discloses disclose a lookup table having a storage capacity of a number obtained by totaling a number at which said difference between the maximum value and the minimum value is an integral multiple of a predetermined value and a number at which the difference is other than the integral multiple and said maximum value is equal to a maximum value of a defined region, and in which data is read from the address generated by said address generating means (Krabbenhöft: column 4, lines

25-40, lines 45-51; The grid points refer to the integral multiple and thus the difference value used in addressing will match these grid points in certain occasions and by definition the size of the table is how many grid points which total points divided by step size; column 6, lines 10-20). Further Krabbenhöft disclose lookup table wherein outputting data from the lookup table at integral multiple of the predetermined value or when said maximum value equal to the maximum value of the defined region, and for interpolating/generating and outputting from the data read from said lookup table and data read from an address adjacent to said address when said difference between the maximum value and the minimum value is not the integral multiple of the predetermined value and when said maximum value not equal to the maximum value of defined region (Krabbenhöft: column 4, lines 25-40, lines 45-51; column 6, lines 10-20).

Hibi et al and Krabbenhöft are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the lookup table method of Krabbenhöft with the color printing system of Hibi et al to implement efficient lookup table for color printing.

The motivation to combine the reference is clear because reducing the size of a lookup table can save memory space and provide for an efficient color conversion.

8. Claim 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5113248 to Hibi et al in view of U.S. Patent Application Publication No. US 2002/0005962 A1 to Iwasaki et al.

Regarding claim 10, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

first generating means for generating a first undercolor component based on a difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Figure 1, reference 7, 6, 5, 4, "Max", "Min"). However Hibi et al does not disclose a second undercolor generating means for generating second undercolor component based on the three values indicating three primary colors for each pixel in said color image data;

first subtracting means for subtracting the first undercolor component generated by said first generating means from the three values indicating the three primary colors for each pixel in said color image data;

second subtracting means for subtracting the second undercolor component generated by said second undercolor generating means from a predetermined first constant; and

calculating means for outputting a calculation result obtained by multiplying a predetermined second constant by a subtraction result of said first subtracting means and further dividing a multiplication result by the subtraction result of said second subtracting means.

Iwasaki et al disclose a second undercolor generating means for generating second undercolor component based on the three values indicating three primary colors

for each pixel in said color image data (Figure 7, reference 40140,40150,40160; page 5, paragraph 108,page 6, paragraph 110, 112);

first subtracting means for subtracting the first undercolor component generated by said first generating means from the three values indicating the three primary colors for each pixel in said color image data (page 5, paragraph 96, last 3 equations);

second subtracting means for subtracting the second undercolor component generated by said second undercolor generating means from a predetermined first constant (page 5, paragraph 108, see equation "255-U" in denominator; page 3, paragraph 67); and

calculating means for outputting a calculation result obtained by multiplying a predetermined second constant by a subtraction result of said first subtracting means and further dividing a multiplication result by the subtraction result of said second subtracting means (page 5, paragraph 108; page 6, paragraph 110,112).

Hibi et al and Iwasaki et al are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the undercolor generation of Iwasaki et al to implement CMYK color printing.

The motivation to combine the reference is clear because Iwasaki et al disclose that the color printing system can adjust for certain color components in images (page 2, paragraph 23, 24, 25-27).

Regarding claim 11, Hibi et al in view of Iwasaki et al disclose the image processing apparatus according to claim 10, wherein said first constant and the second

constant have values both larger than the maximum value of the defined region of said three primary colors (On page 6, paragraph 112, the first constant is defined in this case as "255" in the denominator and the second constant can be defined as either "KGR" or "CGR" or "MGR" or "YGR" in the equation of paragraph 112. In figure 9, one of these functions (KGR) can achieve value of 255.).

Regarding claim 12, Hibi et al in view of Iwasaki et al disclose the image processing apparatus according to claim 10, wherein said first constant and the second constant are equal to each other, and have values both larger than the maximum value of the defined region of said three primary colors (On page 6, paragraph 112, the first constant is defined in this case as "255" in the denominator and the second constant can be defined as either "KGR" or "CGR" or "MGR" or "YGR" in the equation of paragraph 112. In figure 9, one of these functions (KGR) can achieve value of 255 thus both have values of 255 in a region defined by primary colors whose maximum value is below 255.).

Regarding claim 13, Hibi et al in view of Iwasaki et al disclose the image processing apparatus according to claim 10, wherein said second undercolor component is smaller than the first undercolor component (On page 6, paragraph 112, the "U2" can represent the second undercolor wherein U2 represents min(y,m,c) (page 3, paragraph 67) . Y8=Y3 - (R2+G2) according to page 5, paragraph 96. (R2+G2) can represent the first undercolor. Thus the sum of two components as represented by the first undercolor can be bigger than first undercolor represented by min(y,m,c) which is only one component.).

9. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5113248 to Hibi et al in view of U.S. Patent No. 6118550 to Hayashi.

Regarding claim 14, Hibi et al disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black ink addition, said apparatus comprising:

first address generating means for generating a first address based on a difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data and said minimum value (Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4);

a first lookup table in which data is read from first address generated by the first address generating means (Figure 1, reference 6);

processing means for generating a prospective first black ink signal based on the data read from the first lookup table (output of Figure 1, reference 6). However Hibi et al does not disclose an identifying means for identifying a pixel attribute of each pixel in said color image data and outputting a pixel attribute signal;

second address generating means for generating a second address based on the three values indicating the three primary colors for each pixel in said color image data;

a second lookup table in which data is read from second address generated by the second address generating means; and

black ink signal selecting means selecting/outputting either one of the data read from

the second lookup table and the prospective first black signal generated by said processing means as black ink signal in accordance with the image attribute signal of the pixel outputted from said identifying means.

Hayashi disclose an identifying means for identifying a pixel attribute of each pixel in said color image data and outputting a pixel attribute signal (Figure 2, reference 22; column 4, lines 56-64);

second address generating means for generating a second address based on the three values indicating the three primary colors for each pixel in said color image data (In Figure 2, there are three tables(reference 45a-c) used to generate black signal (Bk). They are addressed by output of reference 35a-c);

a second lookup table in which data is read from second address generated by the second address generating means (Figure 2, reference 45a-c); and

black ink signal selecting means selecting/outputting either one of the data read from the second lookup table and the prospective first black signal generated by said processing means as black ink signal in accordance with the image attribute signal of the pixel outputted from said identifying means (Figure 2, reference S4,output of 22 connected to selector S4).

Hibi et al and Hayashi are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the black ink generation and selection of Hayashi with the color printing system of Hibi et al to implement flexible CMYK print system.

The motivation to combine the reference is clear because Hayashi provides for color printing for different image components (photo, characters; Figure 2, reference 35a-35c).

Regarding claim 15, Hibi et al disclose an image processing apparatus for subjecting color image data constituted three primary colors to black ink addition, said apparatus comprising:

first address generating means for generating a first address based on difference between a maximum value and a minimum value among three values indicating the three primary colors for each pixel in said color image data, and said minimum value (Hibi et al: Figure 1, input to reference 6, output of reference 5, and "Min" output of reference 4);

first lookup table which data is read from the first address generated by the first address generating means (Hibi et al: Figure 1, reference 6);

processing means for generating a prospective first undercolor signal based on the data read from the first lookup table (Hibi et al: Figure 1, reference 7). However Hibi et al does not disclose identifying means for identifying a pixel attribute of each pixel in said color image data outputting a pixel attribute signal ;

second address generating means for generating a second address based on the three values indicating the three primary colors for each pixel in said color image data;

a second lookup table in which data is read from the second address generated by the second address generating means;

undercolor signal selecting means for selecting/outputting either one of the data read from the second lookup table and the prospective first undercolor signal generated by said processing means as an undercolor signal in accordance with the image attribute signal of the pixel outputted from said identifying means and;

correcting means for correcting the three values, indicating said three primary colors based on the undercolor signal selected/outputted from the undercolor signal selecting means.

Hayashi discloses identifying means for identifying a pixel attribute of each pixel in said color image data outputting a pixel attribute signal (Hayashi et al: Figure 2, reference 22; column 4, lines 56-64);

second address generating means for generating a second address based on the three values indicating the three primary colors for each pixel in said color image data (Hayashi : Figure 2, reference 35a-c, 31, 32; The output of 34 in Figure 2 address the three UCR 35a-c.);

a second lookup table in which data is read from the second address generated by the second address generating means (Hayashi : Figure 2, reference 35a-c);

undercolor signal selecting means for selecting/outputting either one of the data read from the second lookup table and the prospective first undercolor signal generated by said processing means as an undercolor signal in accordance with the image attribute signal of the pixel outputted from said identifying means (Hayashi: Figure 2, reference S2; output of 22 is connected to selector S2) and;

correcting means for correcting the three values, indicating said three primary colors based on the undercolor signal selected/outputted from the undercolor signal selecting means (Hayashi: output of selector S2 in Figure 2 is inputted to 41 which is then inputted to the C, M, Y signal generator which are corrected accordingly in Figure 2).

Hibi et al and Hayashi are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the undercolor generation and selection of Hayashi with the color printing system of Hibi et al to implement flexible CMYK print system.

The motivation to combine the reference is clear because Hayashi provides for color printing for different image components (photo, characters; Figure 2, reference 35a-35c).

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6118550 to Hayashi further in view of U.S. Patent Application Publication No. US 2002/0005962 A1 to Iwasaki et al.

Regarding claim 16, Hayashi disclose an image processing apparatus for subjecting color image data constituted of three primary colors to black addition, said apparatus comprising:

identifying means for identifying a pixel attribute of each pixel in said color image data and outputting a pixel attribute signal (Hayashi et al: Figure 2, reference 22; column 4, lines 56-64);

first undercolor generating means for generating a first undercolor component based on three values indicating the three primary colors for each pixel in said color image data(Hayashi: Figure 2, reference 35a; output of reference 22);

second undercolor generating means for generating a second undercolor component based on the three values indicating the three primary colors for each pixel in said color image data (Hayashi: Figure 2, reference 35b; output of reference 22);

third undercolor generating means for generating a third undercolor component based on the three values indicating the three primary colors for each pixel in said color image data (Hayashi: Figure 2, reference 35c; output of reference 22);

second calculating means for subtracting said third undercolor component from the three values indicating the three primary colors for each pixel in said color image data and outputting prospective second corrected three primary colors (Figure 2, reference 42,43,44; column 6, lines 62-67; column 7, lines 1-10). However Hayashi does not disclose first subtracting means for subtracting the first undercolor component generated by said first undercolor generating means from the three values indicating the three primary colors for each pixel in said color image data;

second subtracting means for subtracting the second undercolor component generated by said second undercolor generating means from a predetermined first constant ();

first calculating means for outputting prospective first corrected three primary colors obtained by multiplying a predetermined second constant by a subtraction result of said first subtracting means, and further dividing a multiplication result by the subtraction result of said second subtracting means;

selecting means for selecting/outputting either one of the prospective second corrected three primary colors outputted from the second calculating means and the prospective first corrected three primary colors outputted from said first calculating means as corrected three primary colors in accordance with the image attribute signal of the pixel outputted from said identifying means.

Iwasaki et al disclose first subtracting means for subtracting the first undercolor component generated by said first undercolor generating means from the three values indicating the three primary colors for each pixel in said color image data (page 5, paragraph 96, last 3 equations);

second subtracting means for subtracting the second undercolor component generated by said second undercolor generating means from a predetermined first constant (page 5, paragraph 108, see equation "255-U" in denominator; page 3, paragraph 67);

first calculating means for outputting prospective first corrected three primary colors obtained by multiplying a predetermined second constant by a subtraction result of said first subtracting means, and further dividing a multiplication result by the subtraction result of said second subtracting means (page 5, paragraph 108; page 6, paragraph 110,112);

selecting means for selecting/outputting either one of the prospective second corrected three primary colors outputted from the second calculating means and the prospective first corrected three primary colors outputted from said first calculating means as corrected three primary colors in accordance with the image attribute signal of the pixel outputted from said identifying means (Iwasaki et al disclose output selection for

selecting either one of set of ymck data based on a selection signal B1 which depends on the attribute of the image. Thus this selection means can be applied to select either the output of the first calculating means of Iwasaki et al and the second calculating means of Hayashi. (Iwasaki et al: page 3, paragraph 68, 69, 70,75,76; Figure 7, reference 30006)).

Hayashi and Iwasaki et al are combinable because they are in the similar problem area of color printing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine color correction and selection of Iwasaki et al with the color printing system of Hayashi to implement flexible color correction for YMCK printing.

The motivation to combine the reference is clear because Iwasaki et al provide appropriate color correction depending on different components of images (page 3, paragraph 69).

Other Prior Art Cited

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5032903 to Suzuki et al disclose image processor.

U.S. Patent Application Publication No. US 2002/0113982 A1 to Chang et al disclose colorant determining method.

U.S. Patent No. 5710824 to Mongeon disclose printing system with improved gamut.

U.S. Patent No. 6574010 to Ohnuma et al disclose image processor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beniyam Menberu whose telephone number is (571) 272-7465. The examiner can normally be reached on 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on (571) 272-7471. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is (571) 272-2600. The group receptionist number for TC 2600 is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov/>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patent Examiner

Beniyam Menberu

BM

04/30/2005

KAWilliams

KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER